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| EXAMINER | |
|---|---|
| PERILLA, JASON M | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2638 | |

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/052,993 | JEONG, GIBONG | |
| | Examiner | Art Unit | |
| | Jason M. Perilla | 2638 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *11-19* is/are allowed.

6)☒ Claim(s) *1,3 and 20-23* is/are rejected.

7)☒ Claim(s) *2 and 4-10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 November 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. Claims 1-23 are pending in the instant application.

### *Response to Amendment/Arguments*

2. In view of the Applicant's amendments to the claims filed July 29, 2005, the prior art rejections set forth in the first office action dated April 5, 2005 including at least Glas (US 6330290) have been withdrawn. Indeed, Glas does not disclose a direct conversion receiver. Additionally, it is noted by the Examiner that the rejections of claims 5-8 in the first office action were not appropriate because the Examiner failed to note intervening claim 2 which was indicated to contain allowable subject matter.

3. New prior art rejections are set forth below.

4. The claim objections set forth in the first office action were not properly addressed by the Applicant in the response filed July 29, 2005. The claim objections are outstanding and must be either corrected or rebutted.

### *Drawings*

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: figure 1, reference 118. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the

filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

6. Claims 1-23 are objected to because of the following informalities:

Regarding claim 1, in lines 8-9, "the gain and phase imbalance" is lacking antecedent basis.

Regarding claim 2, the variable $\beta_Q$ is not defined in the claim. In lines 1-2, "the gain mismatch" is lacking antecedent basis, in line 3, "the real and imaginary components" is lacking antecedent basis, and, in line 5, "a IQ-swapped spreading sequence" should be replaced by –an I/Q-swapped spreading sequence--.

Regarding claim 4, in lines 1-2, "the phase mismatch" is lacking antecedent basis.

Regarding claim 9, in lines 1-2, "the phase mismatch" is lacking antecedent basis.

Regarding claim 10, the meaning of the function $X(\gamma,\theta)$ is not defined in the claim such that one could appropriately use it, and the variables $\gamma$ and $\theta$ are not defined in the claim such that the function $X(\gamma,\theta)$ could be evaluated. The variables $\gamma$ and $\theta$ in claim 10 are not assumed to be defined in a parent claim because they are not designated by a "carrot".

Regarding claim 11, in line 1, "the gain and phase imbalance" is lacking antecedent basis, and, in line 5, "the real and imaginary components" is lacking antecedent basis.

Regarding claim 12, the claim is objected to for the same reasons as applied to claim 10 above.

Regarding claim 13, in line 1, "the gain and phase" should be replaced by –the gain and phase imbalance--.

Regarding claim 14, in line 1, the limitation "(gain imbalance)" is objected to because it is within parenthesis and one is unable to determine if it further limits the claim or otherwise. In lines 1-2, "in a (CDMA) in a receiver" must be corrected by the Applicant because it is indefinite. In lines 3-4, "the real component", "the regular despread signal", "the imaginary component", and "the I/Q-swapped pilot signal" are each lacking antecedent basis, and in line 6, "the despread pilot signal" is lacking antecedent basis. Further regarding claim 14, "the I/Q swapped pilot signal" in line 4 is not enabled in the specification. That is, the specification provides for an I/Q swapped spreading sequence, but not an I/Q swapped pilot signal. The claim is objected to for being indefinite and not enabled. Correction is required.

Regarding claim 17, the claim is objected to for the same reasons as applied to claim 14 above.

Regarding claim 20, in line 12, "a phase imbalance input port" should be replaced by –a phase imbalance estimate--.

Regarding claim 22, the fifth and sixth multipliers are objected to because they are disclosed as summers (fig. 2, refs. 210 and 212) rather than multipliers (i.e. fig. 2, refs. 202, 204). That is, there *is a distinction* between the components 210 and 202 according the specification and the figures. Therefore, the claim is objected to because it claims subject matter *other than that* which the applicant regards as his invention.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Alelyunas et al (US 5705949 – hereafter "Alelyunas" – previously cited).

Regarding claim 1, Alelyunas discloses, according to the figure, a direct conversion receiver (12) coupled to receive a radio frequency signal (S(t)) and produce an analog signal (I, Q); an analog to digital converter (14) coupled to receive the analog signal and produce baseband digital input signals having real and imaginary components (Id, Qd); and a digital baseband circuit (16), comprising: first and second input ports (I port and Q port) for receiving the digital input signals; and a controller (24 and 28) coupled to the first and second input ports for estimating the gain (24) and phase imbalance of the digital input signals (28; col. 3, lines 20-35).

Regarding claim 3, Alelyunas discloses the limitations of claim 1 as applied above. Further, Alelyunas discloses that the controller is a digital signal processor (col. 3, lines 30-35).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alelyunas in view of Lewis (US 4489392 – previously cited).

Regarding claim 20, Alelyunas discloses according to the figure a gain and phase correction circuit (16), comprising: a first input port for receiving an inphase baseband signal (Id); a second input port for receiving a quadrature baseband signal (Qd); first (26 – having I" output), second (26 – having Q" output), third (26 – taking Tx input), and forth multipliers (26 – taking Ty input), the first and third multipliers having first input ports for receiving the I signal and the second and forth multipliers having first input ports for receiving the Q signal; and a device (24 and 28) having first (Kx output), second (Ky output), third (Tx output) and forth (Ty output) output ports, said first output port coupled to a second input port of the first multiplier, said second output port coupled to a second input port of the second multiplier, said third output port coupled to a second input port in the third multiplier, said forth output port coupled to a second input port in the forth multiplier, said device having a first input port (30) for receiving a

gain imbalance estimate, and a second input port (input to 28; - that is 18A, 18B) for receiving a phase imbalance estimate. In the circuit of Alelyunas, the third and forth multipliers are comprised of, respectively, both multipliers taking the Tx input and both multipliers taking the Ty input. Further, while the first and second multipliers of Alelyunas read the I signal and the Q signal, respectively, the third and forth multipliers receive the outputs of the first and second multipliers rather than the I and Q signals directly. However, the output of the first multiplier is still considered (*as broadly as claimed and to one having skill in the art*) to be the I signal. It is the I signal which has been corrected in gain (I"). Likewise the output of the second multiplier is still considered to be the Q signal. It is the Q signal which has been corrected in gain (Q"). Additionally, while Alelyunas discloses that the phase and gain correction circuit comprises a digital signal processor (DSP; col. 3, line 35), the devices GAIN DETECT and QUAD. PHASE DETECT are not explicitly disclosed as *memory* devices. However, Lewis teaches a method of phase and gain correction for quadrature signals wherein a look up table (fig. 2, ref. 59) is utilized to create a phase/gain signal to a multiplier (fig. 2, ref. 51; col. 2, lines 33-36, 50-55). Lewis discloses that the lookup table is implemented as a read only memory (col. 2, lines 33-36). One skilled in the art is aware that the digital signal processor of Alelyunas could, alternatively, create the phase and gain output signals using an internal lookup table or, as taught by Lewis, an external memory lookup table because the creation of the phase and gain output signals according to a lookup table is both easy to implement and effective. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made

to utilize a lookup table as taught by Lewis in the phase/gain correction circuit of Alelyunas because it could be used to easily and effectively create the phase and gain correction signals to be applied to each of the multipliers of the correction circuit.

Regarding claim 21, Alelyunas in view of Lewis disclose the limitations of claim 21 as applied above. Further, Lewis discloses that the lookup table is implemented as a read only memory (col. 2, lines 33-36).

Regarding claim 22, Alelyunas in view of Lewis disclose the limitations of claim 20 as applied above. Further, Alelyunas discloses a fifth multiplier (summer having immediate I"' OUTPUT) having a first input port for receiving an output from said first multiplier (26 - I" output) and a second input port for receiving an output from said second multiplier (26 – Q" output), and having an output port for providing a corrected I signal (I"' OUTPUT); and a sixth multiplier (summer having immediate Q"' output) having a first input port for receiving an output from said third multiplier (26 – taking Ty input) and a second input port for receiving an output from said fourth multiplier (26 – taking Tx input), and having an output port (Q"' OUTPUT) for providing a corrected Q signal. It is noted by the Examiner that the multipliers (52 and 54) are considered multipliers at least as much as those shown in the illustration of the claimed embodiment of the instant application according to figure 2, references 210 and 212.

Regarding claim 23, Alelyunas in view of Lewis disclose the limitations of claim 20 as applied above. Further, Alelyunas discloses that the I and Q signals are digital signals (FIGURE, ref. 14).

***Allowable Subject Matter***

11. Claims 2, and 4-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The indication of allowable subject matter is made regarding claims 11-19.

13. The following is a statement of reasons for the indication of allowable subject matter:

Claims 2, 4-19 are indicated to contain allowable subject matter because the prior art of record does not disclose or obviate the identification of a gain/phase imbalance from a received despread complex signal (having I and Q components) wherein a first of the two received despread signals is despread by a normal locally generated spread sequence, and the second of the two received despread signals is despread by an I/Q swapped locally generated spread sequence to identify the imbalance.

***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
September 22, 2005

jmp

CHIEH M. FAN
PRIMARY EXAMINER